

APPLICATION OF ECOTOXICOLOGICAL TESTS FOR MONITORING ATMOSPHERIC PARTICLES.

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Theme: Exposure assessment, methods.

Background and aims: Particle size distribution is important for human exposure and risk assessment, as well as for understanding the mechanisms of atmospheric processes. In the present study, the toxicity of particulate matter (PM10) was determined using a rapid and cost-effective bioluminescence assay, the Microtox bioassay. However the ecotoxicological effects of the particulate matter, has not been investigated, thus the current study is a preliminary effort to correlate physicochemical properties of particulate matter to biological impact.

Methods: Samples were collected in an heavy industrialized area of Sicily (Italy). Dust emissions seem to be the most serious problem in the area, as the measured ambient concentrations of suspended particles are at high levels and exceed local and international standards. The air quality control around the area is monitored by a measurement stations network, which has been installed by the CIPA. The ecotoxicological test was based on the measurement of bio luminescence inhibition of the marine bacteria *Vibrio fischeri* within a short exposure time. The % bioluminescence inhibition or the EC50 value (the % of sample concentration that causes 50 % effect on the test organism) of a sample was calculated as an end point. The light emitted from the control sample and the samples have been measured using the Microtox model 500 analyzer after 5,15 and 30 min exposure of the bacteria.

Results: Were tested 20 filters containing PM10, the result EC50 was corrected for the toxicity of white filters. The average EC50 results after 5 minutes of exposure is 26.50%, is 49.48% after 15 and after 30 is 53.07%.

Conclusions: This assay shows good correlations to detect toxicity across a wide spectrum of toxicants. The effect of pollutants on *Vibrio fischeri* is known in the literature for water and sludge, further studies will be able to relate additional information concerning the air.

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